

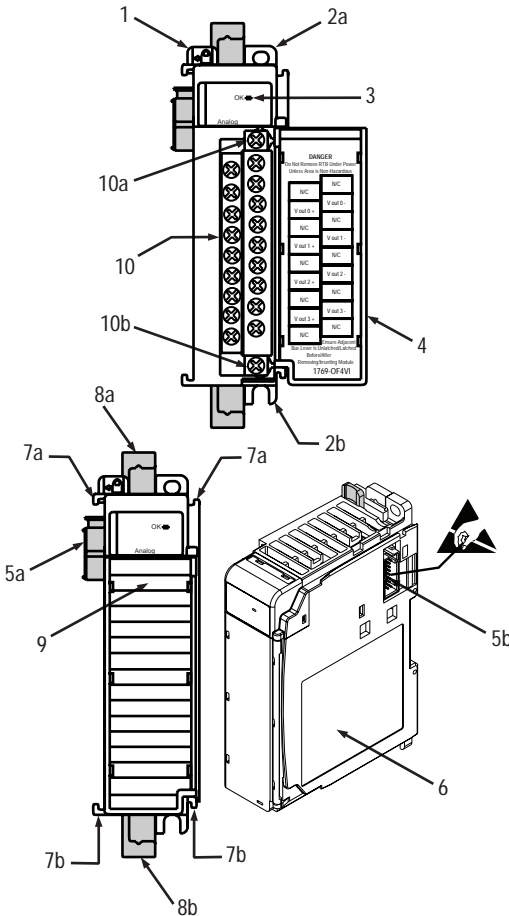


# **Compact 1769-OF4VI Isolated Analog Output Module**

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# Module Description



Item	Description
1	bus lever (with locking function)
2a	upper panel mounting tab
2b	lower panel mounting tab
3	module status LED
4	module door with terminal identification label
5a	movable bus connector with female pins
5b	stationary bus connector with male pins
6	nameplate label
7a	upper tongue-and-groove slots
7b	lower tongue-and-groove slots
8a	upper DIN rail latch
8b	lower DIN rail latch
9	write-on label (user ID tag)
10	removable terminal block (RTB) with finger-safe cover
10a	RTB upper retaining screw
10b	RTB lower retaining screw

## Module Installation

Compact I/O is suitable for use in an industrial environment when installed in accordance with these instructions. Specifically, this equipment is intended for use in clean, dry environments (Pollution degree 2<sup>(1)</sup>) and to circuits not exceeding Over Voltage Category II<sup>(2)</sup> (IEC 60664-1).<sup>(3)</sup>

## Prevent Electrostatic Discharge

### ATTENTION



Electrostatic discharge can damage integrated circuits or semiconductors if you touch bus connector pins or the terminal block. Follow these guidelines when you handle the module:

- Touch a grounded object to discharge static potential.
- Wear an approved wrist-strap grounding device.
- Do not touch the bus connector or connector pins.
- Do not touch circuit components inside the module.
- If available, use a static-safe work station.
- When not in use, keep the module in its static-shield box.

## Remove Power

### ATTENTION



Remove power before removing or inserting this module. When you remove or insert a module with power applied, an electrical arc may occur. An electrical arc can cause personal injury or property damage by:

- sending an erroneous signal to your system's field devices, causing unintended machine motion
- causing an explosion in a hazardous environment

Electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance.

<sup>(1)</sup> Pollution Degree 2 is an environment where, normally, only non-conductive pollution occurs except that occasionally a temporary conductivity caused by condensation shall be expected.

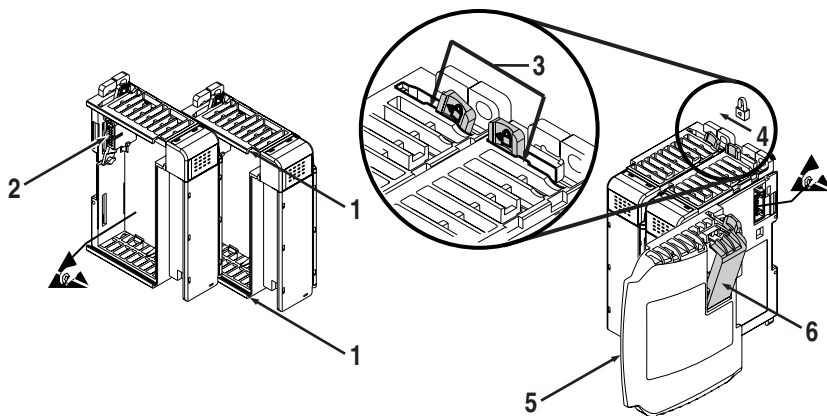
<sup>(2)</sup> Over Voltage Category II is the load level section of the electrical distribution system. At this level transient voltages are controlled and do not exceed the impulse voltage capability of the product's insulation.

<sup>(3)</sup> Pollution Degree 2 and Over Voltage Category II are International Electrotechnical Commission (IEC) designations.

### System Assembly

The module can be attached to the controller or an adjacent I/O module *before* or *after* mounting. For mounting instructions, see “Panel Mounting” on page 6, or “DIN Rail Mounting” on page 7. To work with a system that is already mounted, see “Replacing a Single Module within a System” on page 7.

The following procedure shows you how to assemble the Compact I/O system.



1. Disconnect power.
2. Check that the bus lever of the module to be installed is in the unlocked (fully right) position.
3. Use the upper and lower tongue-and-groove slots (1) to secure the modules together (or to a controller).
4. Move the module back along the tongue-and-groove slots until the bus connectors (2) line up with each other.
5. Push the bus lever back slightly to clear the positioning tab (3). Use your fingers or a small screwdriver.

6. To allow communication between the controller and module, move the bus lever fully to the left (4) until it clicks. Ensure it is locked firmly in place.

**ATTENTION**

When attaching I/O modules, it is very important that the bus connectors are securely locked together to ensure proper electrical connection.

7. Attach an end cap terminator (5) to the last module in the system by using the tongue-and-groove slots as before.
8. Lock the end cap bus terminator (6).

**IMPORTANT**

A 1769-ECR or 1769-ECL right or left end cap must be used to terminate the end of the serial communication bus.

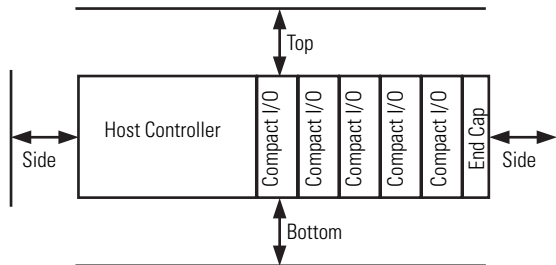
## Mounting Expansion I/O

**ATTENTION**

During panel or DIN rail mounting of all devices, be sure that all debris (metal chips, wire strands, etc.) is kept from falling into the module. Debris that falls into the module could cause damage on power up.

## Minimum Spacing

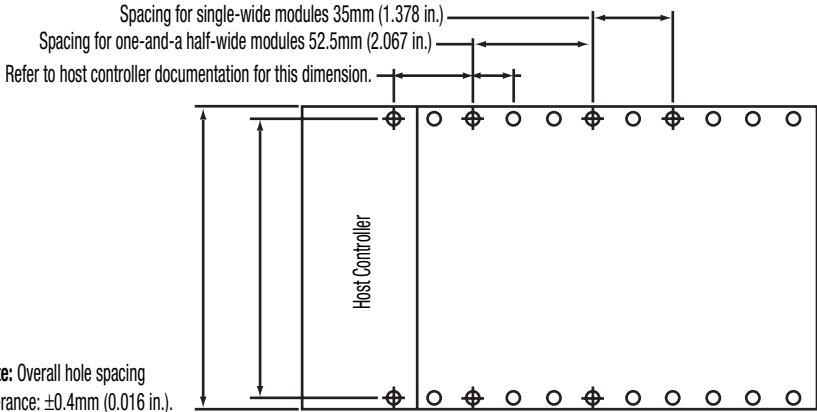
Maintain spacing from enclosure walls, wireways, adjacent equipment, etc. Allow 50 mm (2 in.) of space on all sides for adequate ventilation, as shown:



## Panel Mounting

Mount the module to a panel using two screws per module. Use M4 or #8 panhead screws. Mounting screws are required on every module.

### Panel Mounting Using the Dimensional Template



30535-M

### Panel Mounting Procedure Using Modules as a Template

The following procedure allows you to use the assembled modules as a template for drilling holes in the panel. If you have sophisticated panel mounting equipment, you can use the dimensional template provided on page 6. Due to module mounting hole tolerance, it is important to follow these procedures:

1. On a clean work surface, assemble no more than three modules.
2. Using the assembled modules as a template, carefully mark the center of all module-mounting holes on the panel.
3. Return the assembled modules to the clean work surface, including any previously mounted modules.
4. Drill and tap the mounting holes for the recommended M4 or #8 screw.
5. Place the modules back on the panel, and check for proper hole alignment.
6. Attach the modules to the panel using the mounting screws.

#### TIP

If mounting more modules, mount only the last one of this group and put the others aside. This reduces remounting time during drilling and tapping of the next group.

7. Repeat steps 1 to 6 for any remaining modules.

## DIN Rail Mounting

The module can be mounted using the following DIN rails: 35 x 7.5 mm (EN 50 022 - 35 x 7.5) or 35 x 15 mm (EN 50 022 - 35 x 15).

Before mounting the module on a DIN rail, close the DIN rail latches. Press the DIN rail mounting area of the module against the DIN rail. The latches will momentarily open and lock into place.

## Replacing a Single Module within a System

The module can be replaced while the system is mounted to a panel (or DIN rail). Follow the steps below in order:

1. Remove power. See important note on page 3.
2. On the module to be removed, remove the upper and lower mounting screws from the module (or open the DIN latches using a flat-blade or phillips-style screwdriver).
3. Move the bus lever to the right to disconnect (unlock) the bus.
4. On the right-side adjacent module, move its bus lever to the right (unlock) to disconnect it from the module to be removed.
5. Gently slide the disconnected module forward. If you feel excessive resistance, check that the module has been disconnected from the bus, and that both mounting screws have been removed (or DIN latches opened).

### TIP

It may be necessary to rock the module slightly from front to back to remove it, or, in a panel-mounted system, to loosen the screws of adjacent modules.

6. Before installing the replacement module, be sure that the bus lever on the module to be installed, and on the right-side adjacent module are in the unlocked (fully right) position.
7. Slide the replacement module into the open slot.
8. Connect the modules together by locking (fully left) the bus levers on the replacement module and the right-side adjacent module.
9. Replace the mounting screws (or snap the module onto the DIN rail).

## Module Spare/Replacement Parts

- Terminal block, catalog number 1769-RTBN18
- Door, catalog number 1769-RD (2 per kit)

## Field Wiring Connections

### Grounding the Module

This product is intended to be mounted to a well-grounded mounting surface such as a metal panel. Additional grounding connections from the module's mounting tabs or DIN rail (if used), are not required unless the mounting surface cannot be grounded. Refer to *Industrial Automation Wiring and Grounding Guidelines*, Allen-Bradley publication 1770-4.1, for additional information.

### System Wiring Guidelines

Consider the following when wiring your system:

- Channels are isolated from each other.
- Use Belden™ 8761, or equivalent, shielded wire.
- Under normal conditions, the drain wire and shield junction must be connected to earth ground, via a panel or DIN rail mounting screw at the analog I/O module end. Keep the shield connection to ground as short as possible.<sup>(1)</sup>
- To ensure optimum accuracy, limit overall cable impedance by keeping your cable as short as possible. Locate the I/O system as close to your sensors or actuators as your application will permit.
- Load resistance for each voltage output channel must be equal to or greater than  $2K\ \Omega$

<sup>(1)</sup> In environments where high frequency noise may be present, it may be necessary to ground the shield via a 0.1µF capacitor at the load end and also ground the module end without a capacitor.



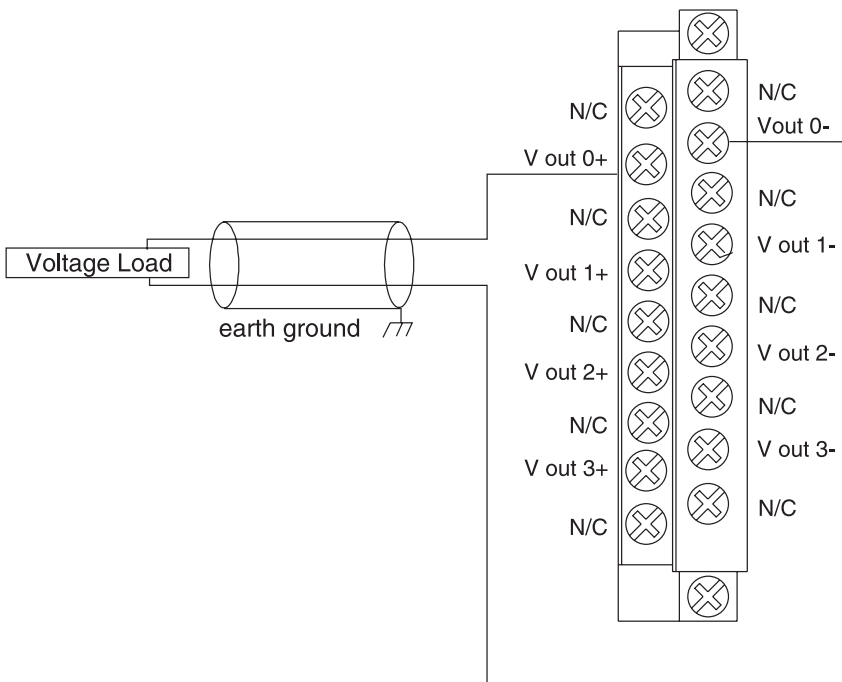
## Wiring Output Devices

Basic wiring of output devices is shown below.

### ATTENTION



- Miswiring of the module to an AC/DC source will damage the module.
- Be careful when stripping wires. Wire fragments that fall into a module could cause damage at power up. Once wiring is complete, ensure the module is free of all metal fragments.

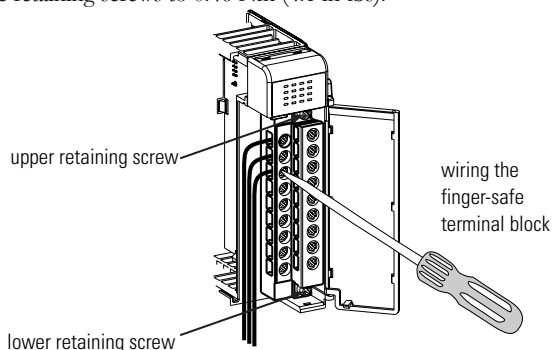


## Labeling the Terminals

A removable, write-on label is provided with the module. Remove the label from the door, mark the identification of each terminal with permanent ink, and slide the label back into the door. Your markings (ID tag) will be visible when the module door is closed.

## Removing the Finger-Safe Terminal Block

To remove the terminal block, loosen the upper and lower retaining screws. The terminal block will back away from the module as you remove the screws. When replacing the terminal block, torque the retaining screws to 0.46 Nm (4.1 in-lbs).



## Wiring the Finger-Safe Terminal Block

When wiring the terminal block, keep the finger-safe cover in place.

1. Loosen the terminal screws to be wired.
2. Route the wire under the terminal pressure plate. You can use the bare wire or a spade lug. The terminals will accept a 6.35 mm (0.25 in.) spade lug.

### TIP

The terminal screws are non-captive. Therefore, it is possible to use a ring lug [maximum 1/4 inch o.d. with a 0.139 inch minimum i.d. (M3.5)] with the module.

3. Tighten the terminal screw making sure the pressure plate secures the wire. Recommended torque when tightening terminal screws is 0.68 Nm (6 in-lbs).

### TIP

If you need to remove the finger-safe cover, insert a screw driver into one of the square, wiring holes and gently pry the cover off. If you wire the terminal block with the finger-safe cover removed, you will not be able to put it back on the terminal block because the wires will be in the way.

# Wire Size and Terminal Screw Torque

Each terminal accepts up to two wires with the following restrictions:

Wire Type		Wire Size	Terminal Screw Torque	Retaining Screw Torque
Solid	Cu-90°C (194°F)	#14 to #22 AWG	0.68 Nm (6 in-lbs)	0.46 Nm (4.1 in-lbs)
Stranded	Cu-90°C (194°F)	#16 to #22 AWG	0.68 Nm (6 in-lbs)	0.46 Nm (4.1 in-lbs)

# I/O Memory Mapping

## Output Data File

For each module, slot x, words 0-3 in the output data file contain the channel 0 through channel 3 output data. Word 4 is used to unlatch any alarm condition that has been latched. Refer to your module's user manual for additional details.

Word	Bit Position															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	SGN	Analog Output Data Channel 0														
1	SGN	Analog Output Data Channel 1														
2	SGN	Analog Output Data Channel 2														
3	SGN	Analog Output Data Channel 3														
4									UU3	U03	UU2	U02	UU1	U01	UU0	U00

- SGN = Sign bit in two's complement format.
- UU = Unlatch under-range (or low-clamp exceeded) alarm.
- UO = Unlatch over-range (or high-clamp exceeded) alarm.

Input Data File

For each module, slot x, input data file words 2-5 contain the state of the module’s output data (output data echo) file words 0-3. During normal operation, these input words represent the analog values that the outputs are directed to by the control program.

Word	Bit Position															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0													S3	S2	S1	S0
1		H3	U3	O3		H2	U2	O2		H1	U1	O1		H0	U0	O0
2	Channel 0 Data Value															
3	Channel 1 Data Value															
4	Channel 2 Data Value															
5	Channel 3 Data Value															

- S = General status (over-range, under-range, or low/high clamp exceeded).
- H = Output held bit.
- U = Under-range (or low-clamp exceeded) alarm.
- O = Over-range (or high-clamp exceeded) alarm.

IMPORTANT

The output module’s input data file reflects the analog output data echo of the module, not necessarily the electrical state of the output terminals. It does not reflect shorted or open outputs.

## Configuration Data File

The manipulation of the bits from this file is normally done with programming software (e.g. RSLogix 500, RSNetworkx for DeviceNet, etc.) during initial configuration of the system. In that case, graphical screens are provided by the programmer to simplify configuration. However, some systems, like the 1769-ADN DeviceNet Adapter, also allow the bits to be altered as part of the control program, using communication rungs. In that case, it is necessary to understand the bit arrangement. The channel configuration words, the first two words of each eight word group, are described on page 14. Refer to your module's user manual for additional details.

Word	Description	Word	Description
0	Channel 0 Configuration Word 0	16	Channel 2 Configuration Word 0
1	Channel 0 Configuration Word 1	17	Channel 2 Configuration Word 1
2	Channel 0 Fault Value Word	18	Channel 2 Fault Value Word
3	Channel 0 Program Idle Mode Word	19	Channel 2 Program Idle Mode Word
4	Channel 0 Low Clamp	20	Channel 2 Low Clamp
5	Channel 0 High Clamp	21	Channel 2 High Clamp
6	Channel 0 Ramp Rate	22	Channel 2 Ramp Rate
7	Channel 0 Spare	23	Channel 2 Spare
8	Channel 1 Configuration Word 0	24	Channel 3 Configuration Word 0
9	Channel 1 Configuration Word 1	25	Channel 3 Configuration Word 1
10	Channel 1 Fault Value Word	26	Channel 3 Fault Value Word
11	Channel 1 Program Idle Mode Word	27	Channel 3 Program Idle Mode Word
12	Channel 1 Low Clamp	28	Channel 3 Low Clamp
13	Channel 1 High Clamp	29	Channel 3 High Clamp
14	Channel 1 Ramp Rate	30	Channel 3 Ramp Rate
15	Channel 1 Spare	31	Channel 3 Spare

*Channel Configuration Words*

<b>Word/Bit</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
Word 0	E	Reserved							SIU	SIO	LA	ER	FM	PM	HI	PFE
Word 1	Reserved					Output Data Format Select			Reserved					Output Type/Range		

- E = Channel Enable: (0 = Disabled, 1 = output Enabled, process changes)
- Reserved = Set to zero
- SIU = System interrupt low clamp, under-range alarms: (0 = Disabled, 1 = Enabled)
- SIO = System interrupt high clamp, over-range alarms: (0 = Disabled, 1 = Enabled)
- LA = Latch low/high clamp, under/over-range alarms: (0 = Disabled, 1 = Enabled)
- ER = Enable ramping: (0 = Disabled, 1 = Enabled. Ramp rate limited by fault states.)
- FM = Fault mode: (0 = Hold Last State, 1 = User Defined Value)
- PM = Program mode: (0 = Hold Last State, 1 = User Defined Value)
- HI = Hold for initialization: (0 = Disabled, 1 = Enabled)
- PFE = Program/idle to fault enable: (0 = Disabled, 1 Enabled)

The first two words of each eight word group in the configuration file allow you to change the parameters of each channel independently. For example, words 8 and 9 correspond to channel 1 while words 16 and 17 correspond to channel 3.

Define	Indicate this	These bit settings															
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Program (Idle) to Fault Enable	Program (Idle) Mode Data Applied <sup>(1)</sup>																0
	Fault Mode Data Applied <sup>(1)</sup>																1
Hold for Initialization	Disabled															0	
	Enabled															1	
Program (Idle) Mode	Hold Last State <sup>(1)</sup>														0		
	User-Defined Value <sup>(1)</sup>														1		
Fault Mode	Hold Last State <sup>(1)</sup>													0			
	User-Defined Fault Value <sup>(1)</sup>													1			
Enable Ramping	Disabled												0				
	Enabled												1				
System Interrupt High Clamp	Disabled											0					
	Enabled <sup>(1)</sup>											1					
System Interrupt Low Clamp	Disabled										0						
	Enabled <sup>(1)</sup>										1						
Enable Channel	Disabled	0															
	Enabled	1															

<sup>(1)</sup> These functions are not supported by all controllers (e.g. MicroLogix 1500) using any configuration method. Refer to your controller manual for details.

Define	Indicate this	These bit settings															
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Output Range Select	-10 to +10V dc														0	0	0
	0 to 5V dc														0	0	1
	0 to 10V dc														0	1	0
	1 to 5V dc														0	1	1
Output Data Select	Raw/Proportional Counts						0	0	0								
	Engineering Units						0	0	1								
	Scaled for PID						0	1	0								
	Percent Range						0	1	1								

# Specifications

## General Specifications

Specification	Value
Dimensions	118 mm (height) x 87 mm (depth) x 35 mm (width) height including mounting tabs is 138 mm  4.65 in. (height) x 3.43 in (depth) x 1.38 in (width) height including mounting tabs is 5.43 in.
Approximate Shipping Weight (with carton)	270g (0.6 lbs.)
Storage Temperature	-40°C to +85°C (-40°F to +185°F)
Operating Temperature	0°C to +60°C (32°F to +140°F)
Operating Humidity	5% to 95% non-condensing
Operating Altitude	2000 meters (6561 feet)
Vibration	Operating: 10 to 500 Hz, 5G, 0.030 in. peak-to-peak
Shock	Operating: 30G, 11 ms panel mounted (20G, 11 ms DIN rail mounted)  Non-Operating: 40G panel mounted (30G DIN rail mounted)
Agency Certification	<ul style="list-style-type: none"> <li>• C-UL certified (under CSA C22.2 No. 142)</li> <li>• UL 508 listed</li> <li>• CE compliant for all applicable directives</li> </ul>
Hazardous Environment Class	Class I, Division 2, Hazardous Location, Groups A, B, C, D (UL 1604, C-UL under CSA C22.2 No. 213)
Radiated and Conducted Emissions	EN50081-2 Class A
<i>Electrical /EMC:</i>	<i>The module has passed testing at the following levels:</i>
<ul style="list-style-type: none"> <li>• ESD Immunity (IEC1000-4-2)</li> </ul>	<ul style="list-style-type: none"> <li>• 4 kV contact, 8 kV air, 4 kV indirect</li> </ul>
<ul style="list-style-type: none"> <li>• Radiated Immunity (IEC1000-4-3)</li> </ul>	<ul style="list-style-type: none"> <li>• 10 V/m, 80 to 1000 MHz, 80% amplitude modulation</li> </ul>
<ul style="list-style-type: none"> <li>• Fast Transient Burst (IEC1000-4-4)</li> </ul>	<ul style="list-style-type: none"> <li>• 2 kV, 5 kHz</li> </ul>
<ul style="list-style-type: none"> <li>• Surge Immunity (IEC1000-4-5)</li> </ul>	<ul style="list-style-type: none"> <li>• 1 kV galvanic gun</li> </ul>
<ul style="list-style-type: none"> <li>• Conducted Immunity (IEC1000-4-6)</li> </ul>	<ul style="list-style-type: none"> <li>• 10V dc, 0.15 to 80 MHz<sup>(1)</sup></li> </ul>

<sup>(1)</sup> Conducted Immunity frequency range may be 150 kHz to 30 MHz if the Radiated Immunity frequency range is 30 MHz to 1000 MHz.



## Output Specifications

Specification	1769-OF4VI
Analog Normal Operating Ranges <sup>(1)</sup>	$\pm 10\text{V dc}$ , 0 to 10V dc, 0 to 5V dc, 1 to 5V dc
Full Scale Analog Ranges <sup>(1)</sup>	$\pm 10.5\text{V dc}$ , -0.5 to 10.5V dc, -0.5 to 5.25V dc, 0.5 to 5.25V dc
Number of Outputs	4 isolated differential
Bus Current Draw (max.)	145 mA at 5V dc 75 mA at 24V dc
Heat Dissipation	2.0 Total Watts (all points - 10V dc into 2 k - worst case calculated)
Digital Resolution Across Full Range	15 bits plus sign (bipolar)  $\pm 10\text{V dc}$ : 15.89 bits, 330 $\mu\text{V/bit}$ 0 to +5V dc: 13.89 bits, 330 $\mu\text{V/bit}$ 0 to +10V dc: 14.89 bits, 330 $\mu\text{V/bit}$ +1 to +5V dc: 13.57 bits, 330 $\mu\text{V/bit}$
Conversion Rate (all channels) max.	120 ms
Step Response to 63% <sup>(2)</sup>	<2.9 ms
Load Output Current	5 mA max.
Load Range Output	$\geq 2\text{K } \Omega$
Max. Capacitive Load	1 $\mu\text{F}$
Field Calibration	None required
Overall Accuracy <sup>(3)</sup>	$\pm 0.5\%$ full scale at 25°C

<sup>(1)</sup> The over- or under-range flag will come on when the normal operating range (over/under) is exceeded. The module will continue to convert the analog output up to the maximum full scale range. The flag automatically resets when within the normal operating range unless configured to latch.

<sup>(2)</sup> Step response is the period of time between when the D/A converter was instructed to go from minimum to full range until the device is at 63% of full range.

<sup>(3)</sup> Includes offset, gain, drift, non-linearity and repeatability error terms.

<b>Specification</b>	<b>1769-OF4VI</b>
Accuracy Drift with Temperature	±0.0086% FS per °C
Output Ripple <sup>(1)</sup> range 0 to 50 kHz (referred to output range)	±0.05%
Non-linearity (in percent full scale)	±0.05%
Repeatability <sup>(2)</sup> (in percent full scale)	±0.05%
Output Error Over Full Temperature Range (0 to 60°C [+32 to +140°F])	±0.8%
Output Impedance	<1 Ω
Open and Short-Circuit Protection	Yes
Short-Circuit Current	35 mA typical, 42 mA max.
Output Overvoltage Protection	Yes
Output Response at System Power Up and Power Down	Power up: ±1.2V dc spike for less than 0.4 ms Power down: 1.2V dc spike for less than 21 ms
Rated Working Voltage <sup>(3)</sup>	30V ac/30V dc
Output Group to Bus Isolation	500V ac or 710V dc for 1 minute (qualification test)  30V ac/30V dc working voltage (IEC Class 2 reinforced insulation)
Module OK LED	On: module has power, has passed internal diagnostics, and is communicating over the bus.  Off: Any of the above is not true.
Channel Diagnostics	Over- or under-range by bit reporting

<sup>(1)</sup> Output ripple is the amount a fixed output varies with time, assuming a constant load and temperature.

<sup>(2)</sup> Repeatability is the ability of the output module to reproduce output readings when the same controller value is applied to it consecutively, under the same conditions and in the same direction.

<sup>(3)</sup> Rated working voltage is the maximum continuous voltage that can be applied at the output terminal, including the output signal and the value that floats above ground potential (for example, 10V dc output signal and 20V dc potential above ground).

Specification	1769-OF4VI
System Power Supply Distance Rating	The module may not be more than 8 modules away from the system power supply.
Recommended Cable	Belden 8761 (shielded)
Vendor I.D. Code	1
Product Type Code	10
Product Code	42
Input Words	6
Output Words	5
Configuration Words	32

## Hazardous Location Considerations

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D or non-hazardous locations only. The following ATTENTION statement applies to use in hazardous locations.

### ATTENTION



#### EXPLOSION HAZARD

- Substitution of components may impair suitability for Class I, Division 2.
- Do not replace components or disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
- Do not connect or disconnect components unless power has been switched off or the area is known to be non-hazardous.
- This product must be installed in an enclosure.

All wiring must comply with N.E.C. article 501-4(b).

## Environnements dangereux

Cet équipement est conçu pour être utilisé dans des environnements de Classe 1, Division 2, Groupes A, B, C, D ou non dangereux. La mise en garde suivante s'applique à une utilisation dans des environnements dangereux.

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### ATTENTION



#### DANGER D'EXPLOSION

- La substitution de composants peut rendre cet équipement impropre à une utilisation en environnement de Classe 1, Division 2.
- Ne pas remplacer de composants ou déconnecter l'équipement sans s'être assuré que l'alimentation est coupée et que l'environnement est classé non dangereux.
- Ne pas connecter ou déconnecter des composants sans s'être assuré que l'alimentation est coupée ou que l'environnement est classé non dangereux.

Ce produit doit être installé dans une armoire.

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## For More Information

For	Refer to this Document	Pub. No.
A more detailed description of how to install and use your Compact I/O with MicroLogix 1500 programmable controller.	MicroLogix 1500 Programmable Controllers User Manual	1764-UM001
Detailed information on installing, programming, and troubleshooting your Compact Analog I/O modules.	Compact I/O Analog Modules User Manual	1769-UM002
A detailed description of how to install and use your Compact I/O with the 1769-ADN DeviceNet Adapter.	1769-ADN DeviceNet Adapter User Manual	1769-UM001
An overview of the MicroLogix 1500 system, including Compact I/O.	MicroLogix 1500 Programmable Controller with Compact I/O for Expansion	1764-S0001
More information on proper wiring and grounding techniques.	Industrial Automation Wiring and Grounding Guidelines	1770-4.1

If you would like a manual, you can:

- download a free electronic version from the internet:  
**[www.ab.com/micrologix](http://www.ab.com/micrologix) or [www.ab.com/literature](http://www.ab.com/literature)**
- purchase a printed manual by:
  - contacting your local distributor or Rockwell Automation representative
  - calling 1.800.963.9548 (USA/Canada)  
or 001.330.725.1574 (Outside USA/Canada)

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Belden is a trademark of Belden, Inc.

## **Notes:**



# Rockwell Automation Support

Rockwell Automation provides technical information on the web to assist you in using our products. At <http://support.rockwellautomation.com>, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration and troubleshooting, we offer TechConnect Support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit <http://support.rockwellautomation.com>.

## Installation Assistance

If you experience a problem with a hardware module within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your module up and running:

United States	1.440.646.3223 Monday – Friday, 8am – 5pm EST
Outside United States	Please contact your local Rockwell Automation representative for any technical support issues.

## New Product Satisfaction Return

Rockwell tests all of our products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned:

United States	Contact your distributor. You must provide a Customer Support case number (see phone number above to obtain one) to your distributor in order to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for return procedure.

[www.rockwellautomation.com](http://www.rockwellautomation.com)

### Corporate Headquarters

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